

REMARKS

Applicants' Attorney of Record thanks Examiner Lorengo for the courtesy extended in the telephone interview of February 24, 2006.

First, with respect to the remarks made in the Office Action with respect to the significance of the preamble, Applicants disagree that the phrase "for drop on demand inkjet printing" is of no consequence. Applicants submit that since the present rejections relate to obviousness, the suitability for drop on demand printing of the ink formulation of the present invention is of particular significance. With respect to the present rejections, Applicants further wish to emphasize the significance of the declaration of inventor Dr. James Fox that was submitted with the previous amendment but was not acknowledged in the most recent Office Action.

As discussed in Dr. Fox's declaration, two different inkjet technologies exist and as such have different complexities associated with their ink design. Continuous inkjet (CIJ) printing forms a jet of droplets all of the time that the printer is active and ready to print. The drops to be printed are then selected by charging them, which causes them to be deflected from the continuous droplet stream, and the remaining unprinted drops are recycled. In drop on demand (DOD) inkjet printing, droplets are only produced from the nozzle by a pressure pulse when required and so the nozzle may experience long idle (dwell) periods between droplet ejections. During these idle periods, water will evaporate from the nozzle and a humectant is required to reduce the rate of evaporation and maintain the ink as a liquid in the nozzle, preventing clogging of the nozzle with dried ink.

In his declaration, Dr. Fox points out that from his experience in the field of inkjet printing a need exists in the industry for an ink formulation that is suitable for DOD inkjet printing that

provides good humectancy in addition to good wetfastness. According to Dr. Fox, the present invention unexpectedly meets this need. Dr. Fox also points out that there is significance in both the selection of polypropylene glycol (PPG) and in the amount of PPG in the formulations of the present invention. As indicated by Dr. Fox, it is preferred to use the minimum amount of PPG that will give an acceptable dwell time so as to minimize the viscosity of the ink and, therefore, maximize the allowable concentration of functional material that can be incorporated into the ink. This desired amount of PPG is expressed as a ratio of pigment to PPG. As further described by Dr. Fox, it was a surprising result to find that PPG whilst having a powerful humectant effect did not reduce the wetfastness of the printed image and that it was also surprising to find that PPG at such low concentrations (relative to the pigment concentration) could continue to exhibit an acceptable humectant effect.

Furthermore, with respect to the rejection of claims 1-6, 10-12, 14-16, 20, 21 and 24-26 under 35 U.S.C. 103(a) as being unpatentable over Thakkar, the Thakkar reference is specific to CIJ printing, whereas the present invention is concerned with DOD inkjet printing. As discussed by Dr. Fox in his declaration, the present invention unexpectedly improves dwell performance in DOD inkjet printing, whilst also providing good wetfastness of the printed image. For the CIJ printing technique employed by Thakkar, dwell performance is not relevant as the jet is continuously present during printing. Furthermore, the issue of re-dispersibility with which Thakkar is concerned is not relevant to DOD inkjet printing. As stated by Dr. Fox, it would therefore not be obvious to one of ordinary skill in the art to take a CIJ ink and use it in a DOD printer, as it would be expected that the ink would have poor dwell performance in the DOD printer due to the low level of humectant used, as well as the incorporation of materials for re-dispersability unnecessarily compromising the wetfastness of the printed image. Therefore, one

of ordinary skill in the art would not look to Thakkar which is specific to CIJ printing for teachings or suggestions as to how to solve the problems such as dwell performance which are particular to DOD inkjet printing.

With respect to the rejection of claims 1-7, 10-16, and 24-26 under 35 U.S.C. 103(a) as being unpatentable over EP 1 114 850, Applicants submit that EP 1 114 850 does not render the present invention obvious. As discussed by Dr. Fox in his declaration, the examples of EP 1 114 850 A1 specifically referred to by the Examiner are Comparative Example W3 and Comparative Example W4. On page 10, paragraph 75, EP 1 114 850 A1 describes these two formulations as *unsuitable* for inkjet printing as they “could not be stably ejected [from the print head] due to their high viscosity” (emphasis added). Applicant contends that one of ordinary skill in the art would not look to an ink formulation which is inoperable for inkjet printing by the reference’s own admission to arrive at the inkjet formulation of the present invention. Furthermore, as emphasized by Dr. Fox in his declaration, the formulation of Comparative Example W3 describes a low pigment to PPG ratio and that if this ink was to be printable, the presence of such a high concentration of glycerin would override the PPG effect and the wet fastness would be poor. In his opinion, using other humectants in combination with PPG would reduce the wetfastness of the final printed image.

Thus, Applicants contend that it would not be obvious to start with inoperable ink formulations and attempt to modify them to make them suitable for inkjet printing. Furthermore, as pointed out by Dr. Fox, the other humectant (glycerin) included in these formulations would compromise the wetfastness and so the benefit of the use of PPG would not be realized even if the formulations were modified so as to be functional. Accordingly, Applicants respectfully requests reconsideration and withdrawal of the rejection.

In view of the foregoing, it is respectfully urged that the present claims are in condition for allowance and reconsideration is requested. An early notice to this effect is earnestly solicited. Should there be any questions regarding this application, the Examiner is invited to contact the undersigned at the number shown below.

Respectfully submitted,



Susan S. Jackson
Registration No. 41,302
Kennedy Covington Lobdell & Hickman, L.L.P.
Hearst Tower, 47th Floor
214 N. Tryon Street
Charlotte, North Carolina 28202
Telephone (704) 331-7410
-- Attorney for Applicant